

## CLAIMS:

1. A sensor comprising:

a substrate; and

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a polymeric film disposed on the substrate, the polymeric film comprising at least one hardblock component and at least one softblock component.

5 2. A sensor according to claim 1, wherein the polymeric film comprises thermoplastic elastomers.

3. A sensor according to claim 1, wherein the sensor comprises a sensor selected from acoustic wave sensors, quartz crystal microbalance (QCM) sensors, or surface acoustic wave (SAW) chemical sensors.

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4. A sensor according to claim 1, wherein the polymeric film comprises at least one polymer selected from polyester elastomer, polyether block polyamides, silicone polyimides, and combinations thereof.

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15 5. A sensor according to claim 1, wherein the polymeric film comprises a component that partitions hydrocarbon vapor as it enters the polymeric film.

20 6. A sensor according to claim 1, wherein the polymeric film comprises a component that provides at least one of: structural integrity in the polymeric film; reduced swelling of the polymeric films when the polymeric film is exposed to hydrocarbon vapors; and enhanced surface adhesion of the polymeric film to a surface of the sensor.

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7. A sensor according to claim 1, wherein the polymeric film comprises polyester elastomer, the polyester elastomer comprising the softblock component and the hard component.

8. A sensor according to claim 7, wherein the softblock component comprises polyoxyalkylene diimide diacids and the hardblock component comprises polyalkylene terephthalate.

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5 ~~9. A sensor according to claim 1, wherein the polymeric film comprises polyether block polyamides.~~

10. A sensor according to claim 9, wherein the polyether block polyamides comprise softblock polyether components and hardblock polyamide (nylon) components.

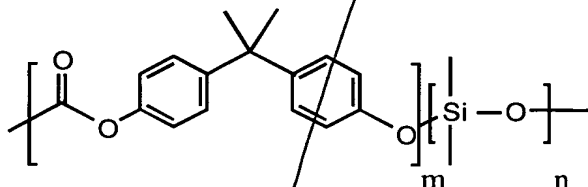
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10 ~~11. A sensor according to claim 1, wherein the polymeric film comprises silicone polyimides, the silicone polyimides comprise hardblock and softblock elastomers.~~

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15 12. A sensor according to claim 1, wherein the sensor comprises a sensor substrate, the sensor substrate comprises a quartz crystal microbalance (QCM) sensor is provided with an AT-cut quartz crystals with gold (Au) electrodes.

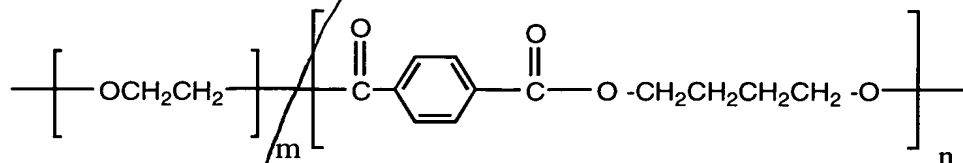
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15 ~~13. A sensor according to claim 1, wherein the polymeric film comprises polymers comprising at least one repeating structural units, the repeating structural units being functionalized with groups that enhance selectivity and sensitivity of the sensor to various target compounds.~~

20 14. A sensor according to claim 1, wherein the polymeric film comprises:

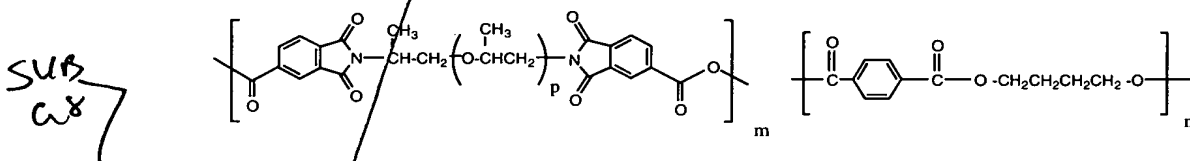
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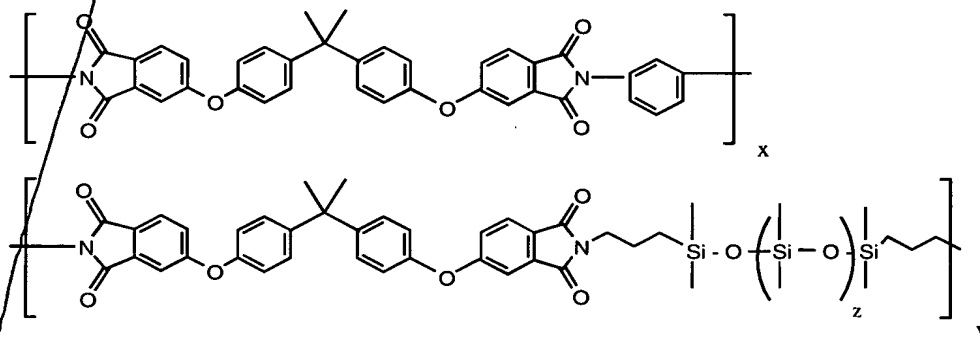
15. A sensor according to claim 1, wherein the polymeric film comprises:



16. A sensor according to claim 1, wherein the polymeric film comprises:



17. A sensor according to claim 1, wherein the polymeric film comprises:



18. A polymeric film for a sensor, the polymeric film comprising at least one hardblock component and at least one softblock component.

19. A polymeric film according to claim 18, wherein the polymeric film comprises thermoplastic elastomers.

20. A polymeric film according to claim 18, wherein the polymeric film comprises at least one polymer selected from polyester elastomer, polyether block polyamides, silicone polyimides, and combinations thereof.

5 21. A polymeric film according to claim 18, wherein the polymeric film comprises a component that partitions hydrocarbon vapor as it enters the polymeric film.

10 22. A polymeric film according to claim 18, wherein the polymeric film comprises a component that provides at least one of: structural integrity in the polymeric film; reduced swelling of the polymeric films when the polymeric film is exposed to hydrocarbon vapors; and enhanced surface adhesion of the polymeric film to a surface of the sensor.

15 23. A polymeric film according to claim 18, wherein the polymeric film comprises polyester elastomer, the polyester elastomer comprising the softblock component and the hard component.

24. A polymeric film according to claim 23, wherein the softblock component comprises polyoxyalkylene diimide diacids and the hardblock component comprises polyalkylene terephthalate.

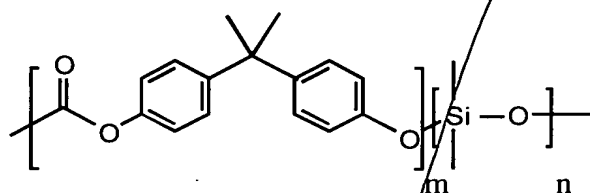
25. A polymeric film according to claim 18, wherein the polymeric film comprises polyether block polyamides.

20 26. A polymeric film according to claim 25, wherein the polyether block polyamides comprise softblock polyether components and hardblock polyamide (nylon) components.

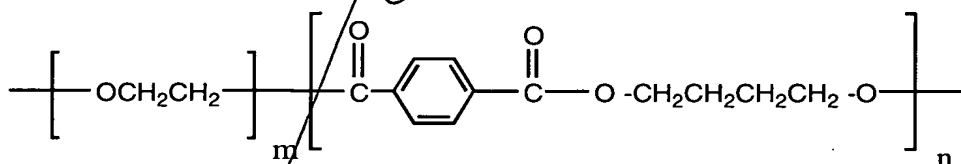
25 27. A polymeric film according to claim 18, wherein the polymeric film comprises silicone polyimides, the silicone polyimides comprise hardblock and softblock elastomers.

28. A polymeric film according to claim 18, wherein the polymeric film comprises polymers comprising at least one repeating structural units, the repeating structural units being functionalized with groups that enhance selectivity and sensitivity of the sensor to various target compounds.

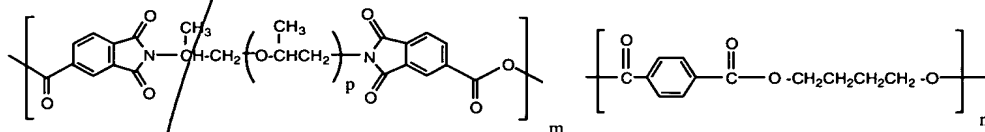
29. A polymeric film according to claim 18, wherein the polymeric film comprises:



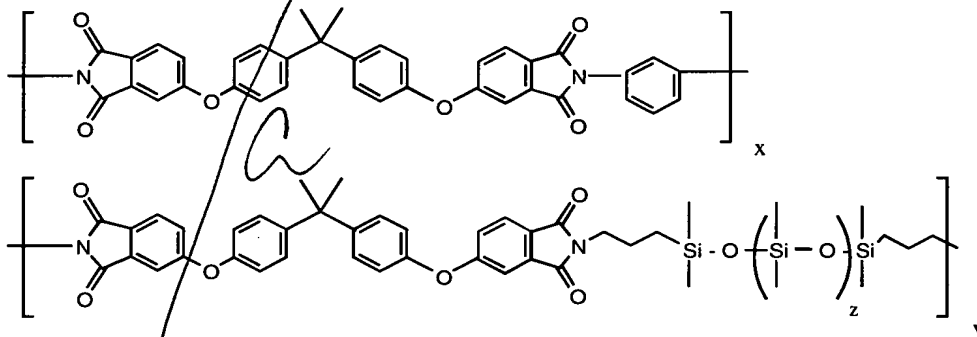
30. A polymeric film according to claim 18, wherein the polymeric film comprises:



31. A sensor according to claim 18, wherein the polymeric film comprises:



32. A sensor according to claim 18, wherein the polymeric film comprises:



5 33. A method for enhancing detection of a target compound by a sensor, the method comprising disposing a polymeric film on a surface of the sensor, the polymeric film adsorbs the target compound and changes operational sensitivity of the sensor, wherein the polymeric film comprises comprising at least one hardblock component and at least one softblock component.

10 34. A method according to claim 33, wherein the polymeric film comprises thermoplastic elastomers.

35. A method according to claim 33, wherein the sensor comprises sensor selected from acoustic wave sensors, quartz crystal microbalance (QCM) sensors, or surface acoustic wave (SAW) chemical sensors.

36. A method according to claim 33, wherein the polymeric film comprises at least one polymer selected from polyester elastomer, polyether block polyamides, silicone polyimides, and combinations thereof.

37. A method according to claim 33, wherein the polymeric film comprises a component that partitions hydrocarbon vapor as it enters the polymeric film

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38. A method according to claim 33, wherein the polymeric film comprises a component that provides at least one of: structural integrity in the polymeric film; reduced swelling of the polymeric films when the polymeric film is exposed to hydrocarbon vapors; and enhanced surface adhesion of the polymeric film to a surface of the sensor.

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39. A method according to claim 33, wherein the polymeric film comprises polyester elastomer, the polyester elastomer comprising the softblock component and the hard component.

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40. A method according to claim 39, wherein the softblock component comprises polyoxyalkylene diimide diacids and the hardblock component comprises polyalkylene terephthalate.

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41. A method according to claim 33, wherein the polymeric film comprises polyether block polyamides.

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42. A method according to claim 41, wherein the polyether block polyamides comprise softblock polyether components and hardblock polyamide (nylon) components.

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43. A method according to claim 33, wherein the polymeric film comprises silicone polyimides, the silicone polyimides comprise hardblock and softblock elastomers.

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44. A method according to claim 33, wherein the sensor comprises a sensor substrate, the sensor substrate comprises a quartz crystal microbalance (QCM) sensor is provided with an AT-cut quartz crystal with gold (Au) electrodes.

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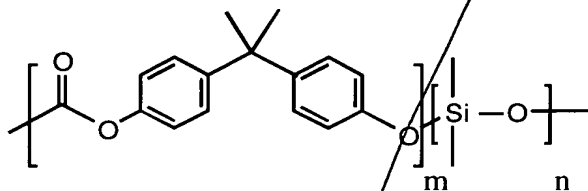
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45. A method according to claim 33, wherein the polymeric film comprises polymers comprising at least one repeating structural units, the repeating structural units being functionalized with groups that enhance selectivity and sensitivity of the sensor to various target compounds.

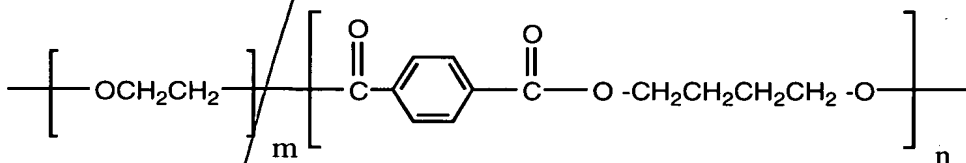
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46. A method according to claim 33, wherein the polymeric film comprises:

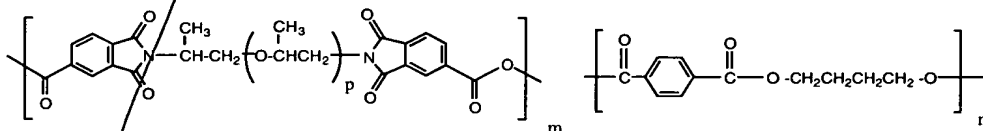


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comprises:

47. A method according to claim 33, wherein the polymeric film



10 48. A method according to claim 33, wherein the polymeric film comprises:





49. A method according to claim 33, wherein the polymeric film comprises:

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